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Choricotyle leonilavazquezae sp. n. (Monogenea: Diclidophoridae) Parasitic on *Microlepidotus brevipinnis* (Osteichthyes: Haemulidae) from Chamela Bay, Jalisco, México

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ABSTRACT: A new species of *Choricotyle* van Beneden and Hesse, 1863, is described from the gills of the sarangola *Microlepidotus brevipinnis* (Steindachner) Jordan and Fisher, (Haemulidae), from the Pacific Ocean in Chamela Bay, Jalisco State, México. Between May 1993 and May 1995, 53 specimens of *M. brevipinnis* were collected and examined for parasites. *Choricotyle leonilavezquezae* sp. n. is distinct from other species within the genus because of the presence of 2 well-developed horseshoe-shaped oral suckers, the shorter longitudinal axis of the haptor, the presence of 8 spines in the genital atrium, and the distribution of vitellaria that extend to the basal area of the peduncles.

KEY WORDS: monogenea, *Choricotyle leonilavazquezae* sp. n., *Microlepidotus brevipinnis*, gills, Chamela Bay, México.

Twenty species of the genus *Choricotyle* have been reported from marine teleosts belonging to different families in temperate and subtropical waters of the world (Crane, 1972; Luque et al., 1993). Other species of *Choricotyle* in teleosts along the Pacific coast of México include those recorded by Bravo (1953) (*C. caulolatili* Meserve, 1938, parasitizing *Trachurops crumenophthalmus* Bloch), by Caballero and Bravo (1962) (*C. sonorensis* Caballero and Bravo, 1962, from *Microlepidotus inornatus* Gill), and by Bravo (1966) (*C. pacifica*, parasitizing *Umbrina sinaloae* Scofield). *Choricotyle sonorensis* was considered as species inquirenda by Mamaev (1976) because its description was based on one specimen; however, Tantaleán et al. (1988) found that this species is a common parasite infecting the haemulid *Isacia conceptionis* from the central Peruvian coast. *Choricotyle pacifica* was transferred to *Hargicotyle* by Mamaev (1972) because of the presence of numerous spines in the genital atrium.

During a survey of the helminth parasites of fishes from Chamela Bay, Jalisco State, México, we collected numerous specimens of an undescribed species of *Choricotyle* parasitizing the sarangola, *Microlepidotus brevipinnis*. We describe that species herein.

Materials and Methods

Fifty-three specimens of *M. brevipinnis* were caught in Chamela Bay, using gill nets, between May 1993 and May 1995. Chamela Bay is located on the W coast of México (19°30′, 19°32′ latitude N and 105°06′ longitude W). Dissection of hosts, collection, fixation, and staining of monogeneans follow procedures described by Leon-Regagnon et al. (1997). Specimens were deposited in the Colección Nacional de Helmintos (CNHE), Mexico City, and in the U.S. National Parasite Collection (USNPC), Beltsville, Maryland. Drawings were prepared with the aid of a camera lucida, and measurements, given in micrometers, are presented as the range followed by the mean ±1SD, in parentheses. When the number of measurements differs from 10, sample size is mentioned. Terminology of the clamps follows that of Llewellyn (1958).

Results

Choricotyle leonilavazquezae sp. n. (Figs. 1–6)

DESCRIPTION (based on 31 flattened specimens, of which 10 were measured): Diclidophoridae, Choricotylinae. Body elongate, distinctly set off from haptor, flattened dorsoventrally; haptor relatively extended, palmate. Body length (including haptor) 910–3,370 (2,240 ± 730), width 500–750 (350 ± 160). Tegument smooth, 3–4 (3 ± 2) thick. Prohaptor rounded, with 2 well-developed horseshoe-shaped suckers; prohaptoral sucker 90–225 (140 ± 50) long by 90–210 (120 ± 50) wide, located immediately below a subterminal mouth surrounded by muscle; pharynx ovoid, posterior to suckers, 70–100 (80 ± 20) long by 50–70 (60 ± 20) wide; esophagus tubular, short. Intestinal bifurcation at level of genital atrium; intestinal caecae ramified, branches not extending beyond haptor.

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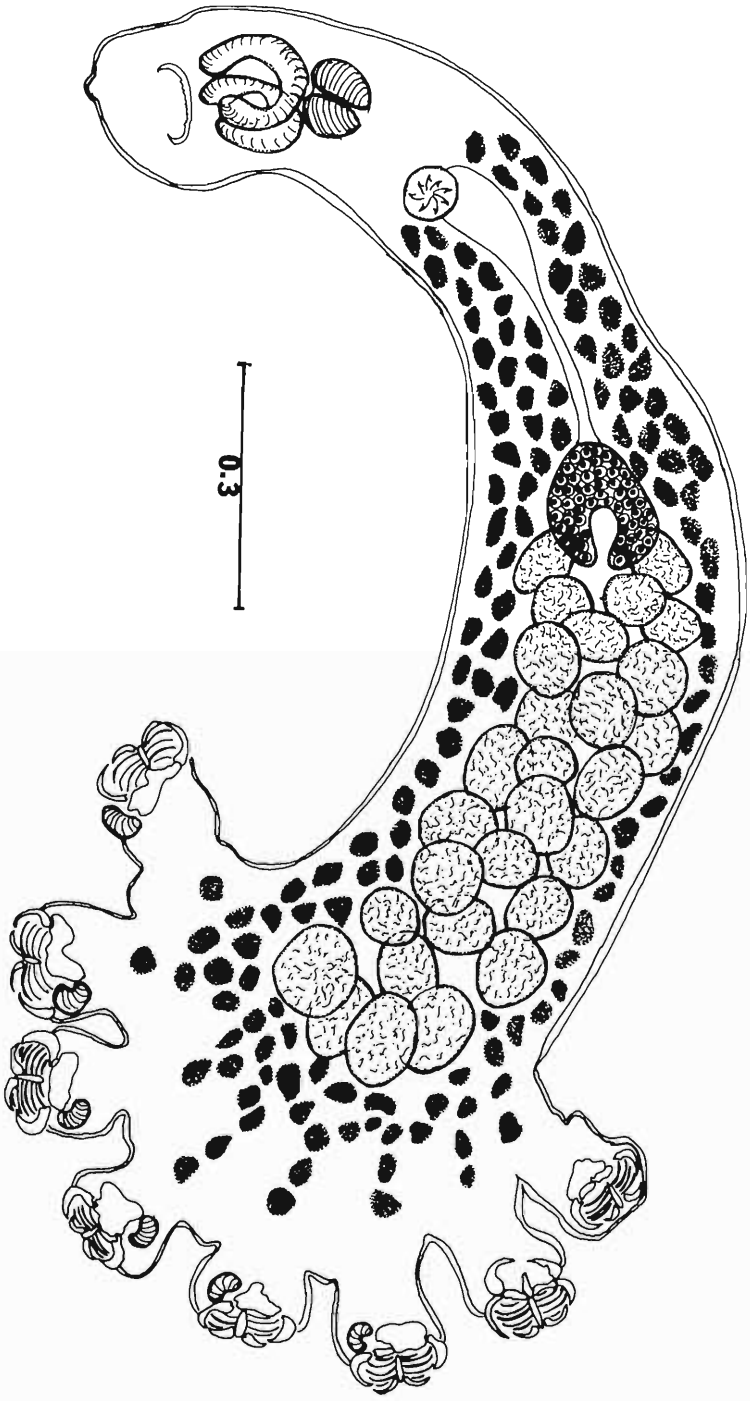
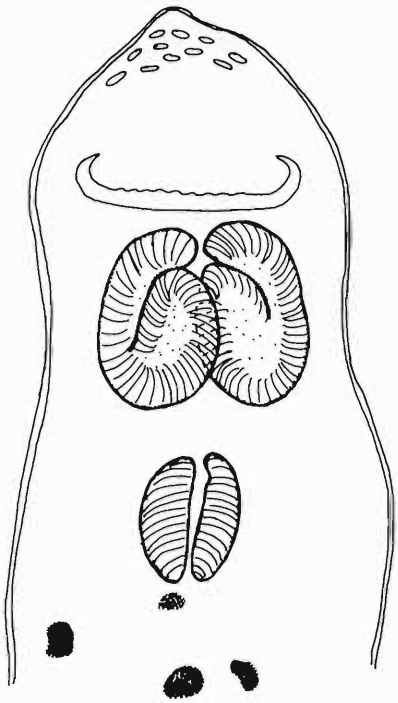
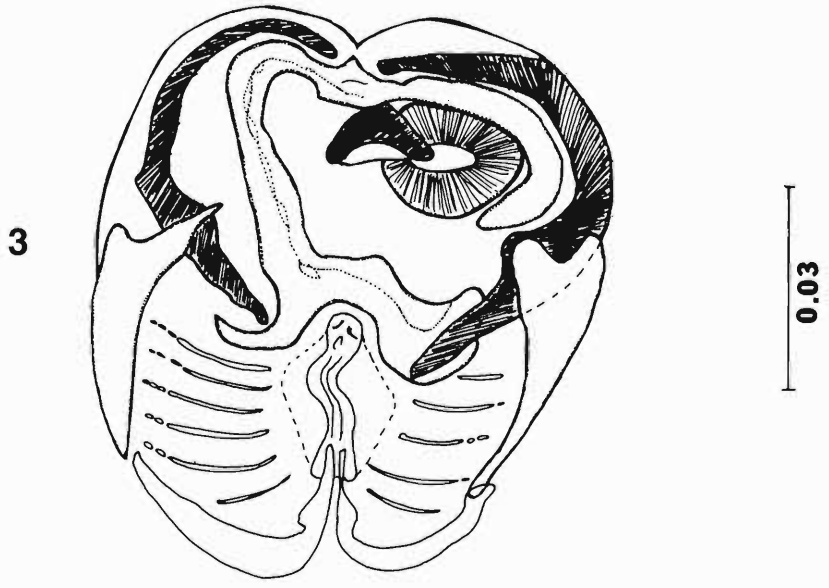
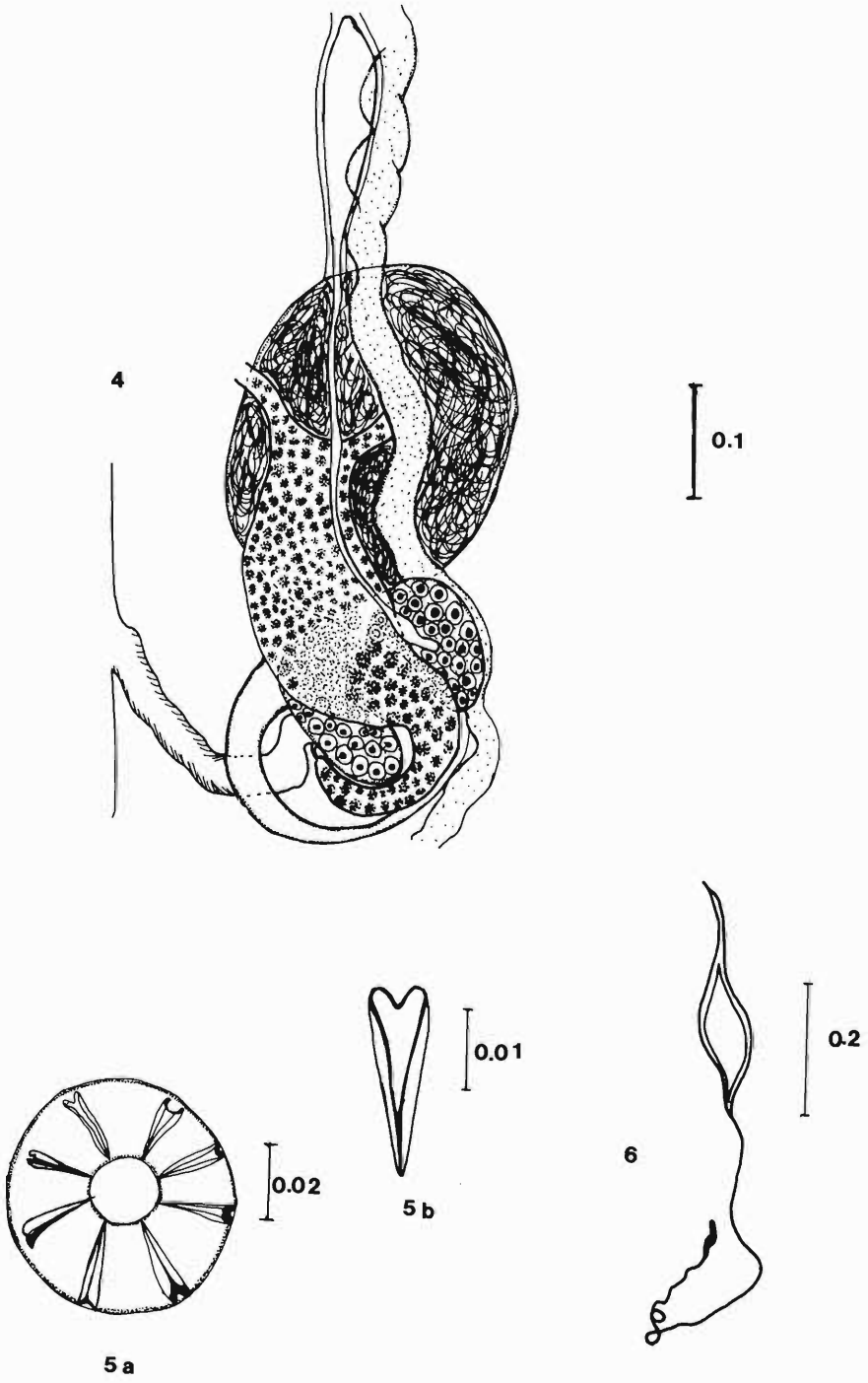


Figure 1. Whole mount illustration of *Choricotyle leonilavazquezae* sp. n., ventral view of the holotype.





Figures 2–3. 2. *Choricotyle leonilavazquezae* sp. n., anterior part of the body showing the horseshoe shape of oral suckers. 3. *Choricotyle leonilavazquezae* sp. n., structure of the clamp.



Figures 4–6. 4. *Choricotyle leonilavazquezae* sp. n., detail of the female reproductive system. 5. a. *Choricotyle leonilavazquezae* sp. n., genital atrium with 8 curved spines. b. Spine of the genital atrium. 6. *Choricotyle leonilavazquezae* sp. n., egg with polar filaments.

Haptor lacking terminal lappet, with 8 unequal clamps, clamp peduncles unequal, 50–100 (90 ± 20) long (excluding clamps). Two pairs of larval hooks occur between peduncles 4 and 5; first hook pair simple, 7.5 (n = 2) long; second pair curved, 8.7 long. Clamps typical of *Choricotyle*; anterior midsclerite subtriangular, thick, curved anteriorly, possessing one muscular pad, associated with anterolateral and axial sclerites and small accessory sclerite. Anterior midsclerite articulated at base with the posterior midsclerite. Posterior midsclerite short, with midlongitudinal groove, slightly curved, base articulated with the first pair of posterolateral and axial sclerites (ventral); ventral axial sclerite curved, in contact with second pair of posterolateral and axial sclerites (dorsal). Posterior quadrants of clamp with 6–7 concentric arcs of skeletal rods.

Testes 33 to 39, intercecal, postovarian; each rounded to oval, shaped 40–120 (80 ± 20) long by 50–120 (90 ± 20) wide. Vas deferens sinuous, extending anteriorly in midline of body dorsal to ovary, opening in genital atrium. Genital atrium spherical, 30–60 (50 ± 10) in diameter, with 8 curved spines; spines 16–18 (17 ± 0.4) long by 6–7 (6.5 ± 0.5) wide.

Ovary bilobed (lobes directed backwards) 80–160 (130 ± 30); oviduct arising from right ovarian lobe, receiving ducts from seminal receptacle and vitellellaria; transverse vitelline ducts join anteriorly to ovary to form saccular vitelline reservoir; oviduct surrounded by Mehlis gland. Ciliated genitointestinal canal originates from oviduct; seminal receptacle well developed, preovarian. Uterus extends anteriorly along midline of body to genital atrium. Vitelline follicles, coextensive and dorsal to intestinal ceca, from the level of genital pore into the haptor to base of peduncles. Eggs yellow, fusiform, with 2 polar filaments, 0.40–0.43 (0.41 ± 0.01) long by 0.07 wide (excluding filaments).

Taxonomic Summary

TYPE HOST: *Microlepidotus brevipinnis* (Steindachner, 1869) Jordan and Fisher, 1895 (Haemulidae).

SITE: Gills.

TYPE LOCALITY: Bahía de Chamela, Estado de Jalisco, México (19°31′N, 105°04′W)

PREVALENCE AND MEAN INTENSITY: 22.6% (2.54 worms per infected host.)

SPECIMENS DEPOSITED: Holotype: Colección Nacional de Helmintos (CNHE), Mexico City, No. 2836. Paratypes: CNHE Nos. 2837–2838, and United States National Parasite Collection, Beltsville, Maryland (USNPC) No. 87057.

ETYMOLOGY: The species is named after Dr. Leonila Vazquez García, eminent Mexican biologist, who dedicated 61 years of her life to study arthropods of México and who died in 1995.

Discussion

Choricotyle van Beneden and Hesse, 1863, was established for *C. chrysophryi,* a parasite of *Chrysophrys aurata* in Belgium (Yamaguti, 1963). Composition of this genus is problematic, since there is no agreement between several authors about taxonomic validity of some species and transference of some of them to other genera (Mamaev, 1972; Oliva, 1987; Luque et al., 1993). In this work, we take the most conservative position and consider the genus to include 20 species (17 mentioned by Oliva (1987) and Luque et al. (1993); plus *C. exilis* Crane, 1972, parasitizing *Lyopsetta exilis* Jordan and Gilbert, from the coast of California; *C. brasiliensis* Luque, Amato, and Takemoto, 1993; and *C. orthopristis* Luque, Amato, and Takemoto, 1993, the latter 2 from *Orthopristis ruber* from Brazil).

Choricotyle leonilavazquezae is characterized by the presence of 2 well-developed suckers in the prohaptor, by the haptor's shorter longitudinal axis, by the presence of 8 spines in the genital atrium, and by the distribution of vitelline follicles extending into the haptor to the base of peduncles. With respect to the distribution of vitelline follicles along the body, the new species most closely resembles 9 of the 20 congeneric species: *C. sonorensis; C. caulolatili; C. anisotremi* Oliva, 1987; *C. exilis; C. australiensis* Roubal, Armitage, and Rhode, 1983; *C. chrysophryi; C. polynemi* Mamaev, 1972; *C. hysteroncha* (Fujii, 1944) Sproston, 1946; and *C. brasiliensis.* Except for *C. exilis, C. chrysophryi, C. hysteroncha,* and *C. brasiliensis,* which possess 8–10, 8–9, 6–10, and 7–10 genital spines, respectively, *C. leonilavazquezae* differs from all of the other species by the number of spines of the genital atrium. The new species differs from *C. chrysophryi,* a very common parasite of sparid fishes in the world (Luque et al., 1993), by having larger oral suckers, by lacking terminal lappet, and because *C. chrysophryi* has cecal diverticules penetrating into peduncles. *Choricotyle leonilavazquezae* is similar to *C. hyster-*

oncha, a parasite of haemulid fishes in Florida, by having vitelline follicles extending into the base of peduncles, but *C. leonilavazquezae* differs from it by the lack of a terminal lappet in the haptor and by having a higher number of testes (33–39 vs. 13–28).

Apparently, *C. exilis* and *C. brasiliensis* are most similar to *C. leonilavazquezae* because of the vitelline follicles extending into the haptor and the complex structure of the clamps. However, *C. leonilavazquezae* differs from *C. exilis* by having shorter peduncles, by having vitelline follicles extending to base of peduncles, and by the size and shape of oral suckers (small and rounded in *C. exilis,* well-developed and horseshoe-shaped in the new species). *Choricotyle exilis* was described by Crane (1972) as a parasite of *Lyopsetta exilis* Jordan and Gilbert from San Pedro, California, whereas the new species we describe herein was collected from *Microlepidotus brevipinnis* from Chamela Bay, in the Pacific of southern Mexico.

Finally, the new species differs from *C. brasiliensis* described from a haemulid (*Orthophristis ruber*) in Brazil by the number and size of testes (33–39 in the new species, measuring about 80 × 90, and 16–21 in *C. brasiliensis,* measuring 60 × 40), by the structure of clamps (anterior quadrant with 1 accessory sucker and posterior quadrant with 6–7 concentric arcs of skeletal rods in the new species, and anterior quadrant with 2 accesory suckers of unequal diameter and posterior quadrant with 4–6 skeletal rods in *C. brasiliensis*), and by the presence of 2 pairs of larval hooks with no terminal lappet in the new species (*C. brasiliensis* has a terminal lappet with 3 pairs of hooks).

The new species appears to be highly specific to the haemulid *Microlepidotus brevipinnis* in Chamela Bay, because it was the only host species in which it was found after analysis of 1,075 hosts representing 115 species. The genus *Choricotyle* is considered specific to perciform fishes worldwide (Mamaev, 1972), and at least 8 of the 20 species are found primarily or exclusively in 4 genera of the family Haemulidae (*Orthopristis, Microlepidotus Haemulon,* and *Anisotremus*). The presence of some congeneric species in haemulid fishes could represent a particular clade within the phylogeny of these fishes. Possible patterns of coevolution and biogeography should be tested through a phylogenetic analysis of the genus, using methods described by Wiley (1981) and Brooks and McLennan (1991, 1993). At this point, it seems that haemulids could represent the primitive host group for *Choricotyle* species and that several host-switching events to other members of the Perciformes took place during the evolutionary history of this taxon.

Acknowledgments

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Meeting Schedule

21 January, 1998	Johns Hopkins University, Montgomery County Center, Rockville, MD, 7:30 pm (Contact person: Thomas Simpson, 410-366-8814 or 757-787-7689)
11 March, 1998	Nematology Laboratory, BARC-West, Beltsville, MD, 7:30 pm (Contact person: David Chitwood, 301-504-8634)
9 May, 1998	University of Pennsylvania, New Bolton Center, Kennett Square, PA, 2:00 pm (Contact person: Phillip Scott, 215-898-1602)
October, 1998	Date and Place TBA
November, 1998	Date and Place TBA